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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,650	07/19/2006	Bernd Bruchmann	293258US0PCT	7727

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ALEXANDRIA, VA 22314

EXAMINER
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SERGEANT, RABON A

ART UNIT	PAPER NUMBER
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1796

NOTIFICATION DATE	DELIVERY MODE
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09/29/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/586,650	<b>Applicant(s)</b> BRUCHMANN ET AL.	
	<b>Examiner</b> Rabon Sergent	<b>Art Unit</b> 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-9 and 11-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-9 and 11-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

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1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-3, 5-9, 11, 12, and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rannard et al (GB 2 324 797) in view of Osterloh et al ('440) and Gerkin et al ('924).

Regarding claims 1 and 9: Rannard et al teach functionalized, branched, polyurea that is produced by reacting carbonyl diimidazole (CDI) with tri-functional polyamine - said polyamine contains both primary and secondary amine groups. It should be noted that CDI has a urea structure and the polyamine has a functionality of 3. Example 3 teaches the reaction performed in the presence of solvent, in the absence of catalyst, and under-reduced pressure (Page 19). Finally, page 17 lines 18-19 teach that the polyurea can be subjected to subsequent functional modification after the branching has completed - this is taken to satisfy the language "subsequent functionalization."

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3. Still, Rannard et al ('797) fail to teach urea other than CDI. Osterloh et al also teach branched polyurea that is useful as a surface coating and is the reaction product of (A) urea and (B) polyamine. (Abstract; col 1 lines 33-40). Therefore, it would have been obvious to also include urea as an amine-reactive compound since it is disclosed by Osterloh et al as being useful as the amine-reactive compound for analogous polyurea and it is *prima facie* obvious to add a known ingredient for its known function. *In re Linder*, 173 USPQ 356; *In re Dial et al.*, 140 USPQ 244. Additionally, one of ordinary skill would have had a reasonable expectation of success in substituting the CDI of Rannard et al for the urea of Osterloh et al since Gerkin et al teach on column 3, lines 15-19 that urea and CDI are suitable equivalents when reacted with polyamine.

4. With respect to applicants' claimed temperature limitation of 100°C to 150°C, it is noted that Rannard et al. teach at page 10 that reaction temperatures above ambient or room temperature may be utilized. Furthermore, it is noted that Osterloh et al. disclose at column 4, lines 51-55 reaction temperatures of 140°C to 230°C, and Gerkin et al. disclose at column 6, lines 26-37 the reaction of an amine with urea at a temperature of 160°C to 200°C. Therefore, in view of the general disclosure within the primary reference that temperatures above ambient or room temperature may be used and the conducting of analogous reactions within the secondary references at the specifically recited elevated temperatures, the position is taken that it would have been obvious to conduct the reaction at virtually any temperature that falls within the range of above ambient to the elevated temperatures of the secondary references. Given the guidance set forth by the prior art, the position is taken that the selection of a reaction temperature amounts to the discovery of an optimum value of a result effective variable. *In re Boesch*, 617 F.2d 272,

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205 USPQ 215 (CCPA 1980). Furthermore, there is no evidence of record to indicate that the claimed temperature range yields an unexpected result.

5. Regarding claim 2: Rannard et al teach that the desired degree of branching in the final polyurea is controlled by introducing difunctional compounds into the reaction system, thereby reducing the number of branches, however, Rannard et al fail to teach diamine as a suitable difunctional urea reactant (Page 11 lines 18-22). Osterloh et al teach the branched polyurea can be produced by reacting (A) urea with (B) polyamine, wherein the polyamine comprises both (Bi) diamine and (Bii) triamine. In particular (Bi) consists of compounds such as butylenediamine, hexamethylenediamine, heptamethylenediamine, and octamethylenediamine, and (Bii) consists of tri-functional polyamine, such as tris(aminoethyl)amine (Col 2 lines 15-48). Therefore, it would have been obvious to include both triamine and diamine in Rannard et al since Osterloh et al teach it as a suitable reactant in an analogous reaction system, and the presence of additional difunctional reactant allows the user to further control the desired degree of branching.

6. Regarding claim 3: Rannard et al teach polyamine comprising bis(hexamethylene) triamine, N-(2-aminoethyl)-propane-1,3-diamine, and tris(2-aminoethyl)amine (Page 10 lines 1-3; page 14 line 31).

7. Regarding claim 5: The polyamine of Rannard et al is tri-functional.

8. Regarding claim 6: As discussed in paragraph 2, Rannard et al teach solvent.

9. Regarding claims 7, 8, and 15: Although Rannard et al teach the reaction of (A) urea and (B) polyamine in the presence of solvent, there is no mention of the specific solvents listed in claim 7 or that said reaction can take place in the an absence of solvent. Therefore, applicants'

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attention is again directed back to Osterloh et al., which teach that toluene, xylene, and/or hydrocarbons, i.e. decane, dodecane - make useful solvents (Col 5 lines 40-45). Thus it would have been obvious to include the solvents of Osterloh et al. in Rannard et al. since they are disclosed as being useful for the production of an analogous branched polyurea. Regarding claims 8 and 15, while Rannard et al. fail to explicitly teach that solvent may be omitted and the examples show the inclusion of solvent - Rannard et al never definitively states that solvent is required. Furthermore, Osterloh et al. states that the relied upon process "can be carried out" in the presence of solvent - the language "can" is optional and therefore said reaction can also take place in the absence of a solvent. Thus it would have been obvious to also omit solvent since it is disclosed by Osterloh et al. as a suitable practice for the production of analogous polyurea.

10. Regarding claim 11: Rannard et al. does not require a catalyst (Page 14 line 28).

11. Regarding claims 12-13 and 15: Rannard et al. neither mandates nor precludes the use of a catalyst. However, Osterloh et al teach the polyurea is produced by reacting polyamine and urea in the presence of catalyst. In particular said catalyst comprises organotin compounds - such as dibutyltin dilaurate (Col 5 lines 17-25). Therefore, it would have been obvious to include the catalyst of Osterloh et al in Rannard et al since they are disclosed by Osterloh et al as being useful in the production of analogous polyurea and one of ordinary skill would understand said catalyst would help the secondary amines react with the remaining urea.

12 Regarding claim 16: As previously discussed the prior art renders obvious a method for producing branched polyurea by reacting polyamine and urea. This reaction is conducted under a vacuum - which would result in the removal of liberated amine. Therefore, Rannard et al fail to explicitly teach that said liberated amine should not be distilled off. Nevertheless, it still

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would have been obvious to refrain from said distillation since example 3 explains that the distilled product is a "sticky solid" - i.e. the removal of the liberated amine results in an increase in viscosity. Thus by keeping the liberated amine in with the branched polyurea would provide the user with a composition that is easily transferable to various containers without the need for introducing additional solvent.

13. Regarding claim 17: As discussed in paragraph 2 - example 3 of Rannard et al teaches reduced pressure which would result in distillation of the liberated amine.

14. Regarding claims 18 and 19: As discussed in paragraph 2, polyurea can be subjected to subsequent functional modification after the branching has completed - i.e. "subsequent functionalization" may or may not occur.

15. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rannard et al (GB 2 324 797) in view of Osterloh et al ('440) and Gerkin et al ('924) and further in view of D'Alelio ('045).

As previously discussed, the prior art renders obvious a method of making branched polyurea by reacting urea and polyamine in the presence of catalyst. Still the prior art fails to teach all of the catalysts in claims 13 and 14. D'Alelio teaches reactions between polyamine and various urea compounds wherein said reaction is preferably catalyzed with potassium carbonate (Right column of page 1, lines 50-55; left column of page 3, lines 49-52). Therefore, it would have been obvious to include potassium carbonate catalyst in the process of Rannard et al since it is disclosed by D'Alelio as being useful in aiding the reaction between urea and amine groups, and it is *prima facie* obvious to add a known ingredient for its known function. *In re Linder*, 173 USPQ 356; *In re Dial et al.*, 140 USPQ 244.

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16. Applicants' arguments have been considered; however, they are inadequate to overcome the prior art rejections. Applicants' argument that it would not have been obvious to substitute the urea compounds of the secondary reference for the carbonyl diimidazole of the primary reference has been considered; however, in view of the relied upon teachings within the secondary references, especially the examples of Gerkin et al. wherein urea and carbonyl diimidazole are reacted with an amine to yield the same compound, the position is maintained that one of ordinary skill in the art would have reasonably expected the respective compounds to function equivalently as reactants with amines. With respect to applicants' arguments concerning Gerkin et al. within pages 8 and 9 of their response, the examiner fails to see how they have arrived at their conclusions concerning the formation of minor amounts of product when urea was utilized. Furthermore, even if this can be substantiated, the relevance of this issue is not clear, since applicants' claims are not limited with respect to such matters as conversion. Applicants' amendment and argument concerning the claimed reaction temperature range has been addressed above within paragraph 4.

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,



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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to R. Sergent at telephone number (571) 272-1079.

/Rabon Sergent/  
Primary Examiner, Art Unit 1765